



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Adress: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,559	09/15/2003	David Darden Chambliss	SJ0920030006US1	3819
46917	7590	08/28/2008	EXAMINER	
KONRAD RAYNES & VICTOR, LLP. ATTN: IBM37 315 SOUTH BEVERLY DRIVE, SUITE 210 BEVERLY HILLS, CA 90212			GOODCHILD, WILLIAM J	
ART UNIT	PAPER NUMBER			
	2145			
MAIL DATE	DELIVERY MODE			
08/28/2008	PAPER			

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/663,559	Applicant(s) CHAMBLISS ET AL.
	Examiner WILLIAM J. GOODCHILD	Art Unit 2145

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 07 July 2008.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-15, 17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-15 and 17-18 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1668)
 Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____
- 5) Notice of Informal Patent Application
 6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 7-12 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha, (US Publication No. 2002/0194324), and further in view of Ng et al., (US Publication No. 2004/0049564), (hereinafter Ng) and Bradley et al., (US Patent No. 7,082,463), (hereinafter Bradley).

Regarding claim 1, Guha discloses a processing unit [paragraph 38, computer contains a processor]; providing an application service connection definition for each of the I/O paths from a host to a storage volume [paragraphs 49 and 57, SLA is created with a definition of a metric to monitor and providing performance criteria to monitor]; providing at least one service level guarantee definition indicating performance criteria to satisfy service requirements included in at least one service level agreement with at least one customer for network resources [paragraphs 49 and 57, SLA is created with a definition of a metric to monitor and providing performance criteria to monitor]; associating each service level guarantee definition with at least one application service

Art Unit: 2145

connection definition [paragraphs 49 and 57, SLA is created with a definition of a metric to monitor and providing performance criteria to monitor];

gathering, I/O performance data for I/O requests transmitted through the I/O paths [paragraph 45, lines 10-15 and paragraph 60 and 62];

transmitting, the gathered performance data to a service level agreement server [paragraphs 60 and 69];

monitoring, by the service level agreement server, whether the performance data for application service connection indicating the I/O requests transmitted through the I/O paths satisfy the performance criteria indicated in the service level guarantee definition associated with the application service connection definitions for the I/O path [paragraph 44];

transmitting, by the service level agreement server, commands to throttle I/O transmission over at least one connection in response to determining that the performance data for at least one connection does not satisfy the performance criteria [paragraph 69].

Guha does not specifically disclose a virtualization controller mapping physical storage resources to virtual volumes in a virtualization layer. However, Ng, in the same field of endeavor discloses virtualization controllers which make one or more physical disks appear as one or more LUNs [Ng, paragraphs 2, 23, 34 and 43]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a virtualization controller to make one or more physical disks appear as one or more

LUNs in order to achieve location independence by abstracting the physical location of the data.

Guha-Ng does not specifically disclose determining, by the service level agreement server, performance data maintained for the application service connection for which the gathered performance data was received;

updating, by the service level agreement server, the determined performance data with the performance data received from the virtualization controller.

However, Bradley discloses the information is created and stored that defines a specific time range for when the one or more tests are to be enforced [Bradley, column 2, line 60 – column 3, line 8]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to store the performance data in order to define SLA's over a time range.

Regarding claim 2, Guha-Ng does not specifically disclose each service level guarantee definition is implemented as a separate element in at least one Extended Markup Language (XML) document, the element for the service level guarantee definition includes the performance criteria defined in the service level agreement, and wherein the application service connection definition for each of the I/O paths is implemented as an element the at least one XML document, wherein attributes of the application service connection definition element provide information on the I/O path. However, Bradley, discloses metric elements [Bradley, column 12, Table 4, column 9, line 29,

Art Unit: 2145

'Standardized Interface Templates' paragraph and column 7, lines 5-7] of an SLA using XML [Bradley, column 13, Table 5 and column 12, Table 4, metric]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate using metric elements of an SLA within XML format in order to allow for greater flexibility while creating and using SLA's.

In reference to claim 3, Guha further discloses multiple service level guarantee definitions indicating different performance criteria are associated with different sets of application service connection definitions [paragraph 49].

In reference to claim 4, Guha further discloses the application service definition for the I/O paths may be associated with the multiple service level guarantee definitions [paragraph 49], wherein the monitoring comprises determining whether the I/O requests transmitted through the I/O paths satisfy the performance criteria of all associated service level guarantee definitions [paragraph 49].

In reference to claim 5, Guha further discloses providing an application service group identifying a plurality of application service connection definitions, wherein associating the at least one service level guarantee definition with the application service connection definitions comprises associating the at least one service level guarantee definition with the at least one application service group [paragraph 14], wherein the application service connection definitions identified in the application service group are

associated with the service level guarantee definition with which their application service group is associated [paragraph 14].

Regarding claim 7, Guha-Ng-Bradley further discloses including one element for each service group in an XML document [Bradley, column 12, Table 4, a metric], including one sub-element for each application service group [Bradley, column 12, Table 4], each sub-element including attributes [Bradley, column 13-23, see each table defining elements and sub-elements].

In reference to claim 8, Guha further discloses monitoring whether the I/O requests transmitted through the I/O path satisfy performance criteria indicated in the service level guarantee definition [paragraph 44] comprises:

gathering performance information concerning I/O requests for the I/O paths [paragraph 45, lines 10-15 and paragraph 60 and 62];

selecting one of the at least one service level guarantee definition [paragraphs 45, 60 and 62]; and

for each of the I/O paths identified by the application service connection definition associated with the selected service level guarantee definition, comparing the gathered performance information for the I/O path with the performance criteria indicated in the selected service level guarantee definition [paragraphs 45, 60 and 62].

In reference to claim 9, Guha further discloses adjusting operations among the I/O paths represented by the application service connection definitions associated with the selected service level guarantee definition if the gathered performance information for the I/O paths does not satisfy the performance criteria [paragraphs 45 and 49].

In reference to claim 10, Guha further discloses adjusting the operations comprises: determining the I/O paths that are over performing and under performing with respect to the performance criteria [paragraph 44]; and throttling the transmission of the I/O requests through the determined I/O paths that are over performing paragraph 62].

In reference to claim 11, Guha further discloses throttling the transmissions comprises delaying the processing of the I/O requests transmitted through the over performing I/O paths [paragraph 69].

In reference to claim 12, Guha further discloses the gathering of the performance information for the I/O paths comprises determining an I/O response time and I/O demand at the I/O paths and comparing the determined I/O response time and the I/O demand with the performance criteria for the I/O response time and the I/O demand in the selected service level guarantee definition [paragraph 69].

In reference to claim 17, Guha further discloses the method / system of claim 1 wherein:
the network comprises a Storage Area Network (SAN) [paragraph 40].

In reference to claim 18, Guha further discloses the at least one application service connection definition, the at least one service level agreement, and the at least one service level guarantee definition, are provided by the service level agreement server in a web service architecture that interfaces with a client to provide real time performance information on the I/O paths to the client [paragraph 39].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guha-Ng-Bradley as applied to claim 5 above, and further in view of Koclaines et al., (hereinafter Koclaines), (US Publication No. 2004/0243699).

Regarding claim 6, Guha-Ng does not specifically disclose providing a service level commitment record associating one service level agreement definition with the at least

Art Unit: 2145

one application service group. However, Koclans, discloses creating an SLA [Koclans, paragraph 37, lines 1-5]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to create an SLA in order to monitor the I/O of a system and provide service guarantee's.

5. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guha-Ng-Bradley as applied to claim 12 above, and further in view of Carlson et al., (hereinafter Carlson), (US Publication No. 2003/0135609).

Regarding claim 13, Guha-Ng-Bradley does not specifically disclose the I/O demand comprises I/O operations per second per unit of contracted storage capacity and I/O throughput per contracted storage capacity. However, Carlson, discloses service level parameters that are monitored are members of a set of service level parameters that may include: a throughput in terms of bytes per second transferred between the at least one host and the storage; and an I/O transaction rate [Carlson, paragraph 19]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the load calculations within the SLA for monitoring in order to monitor the requirements of the SLA metrics.

Regarding claim 14, Guha-Ng-Bradley-Carlson further discloses one of the I/O paths is under performing if a percentage of I/O response times measured for I/O path is less than a percentage guarantee indicated in the selected service level guarantee definition [Carlson, paragraph 126].

Regarding claim 15, Guha-Ng-Bradley-Carlson further discloses one of the I/O paths is under performing if the I/O demand exceeds a demand criteria indicated in the service level guarantee definition and a sampling of the determined I/O response time is less than a response time criteria indicated in the service level guarantee definition [Carlson, paragraph 126].

Response to Arguments

6. Applicant's arguments filed 07/07/2008 have been fully considered but they are not persuasive.

A - Applicant argues "Although the cited Guha discusses how a QoS enforcer monitors performance and that a content controller operates as a management system, nowhere does the cited Guha teach or suggest the claim requirements that a virtualization controller, which maps physical storage resources to virtual volumes gathers I/O performance data and transmits the gathered performance data to a service level agreement server."

A - In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are

based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

B – Applicant argues “the cited Guha does not teach that a service level agreement server transmits commands to the virtualization controller to throttle I/O transmission over the I/O paths if the performance data for the requests does not satisfy the performance criteria.”.

B - In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

C – Applicant argues “the Examiner has not cited any part of the combination of Ng or Guha that teaches or suggests that the service level agreement server determines whether the performance data for application service connections indicating satisfy the performance criteria and if so sends commands to the virtualization controller to throttle I/O transmission over at least one connection in response to determining that the performance data for at least one application service connection for the connection does not satisfy the performance criteria.”.

Art Unit: 2145

C – Guha discloses adjusting flow control based on the thresholds monitored [Guha, paragraph 69], Ng discloses a virtualization controller that would have been obvious to include in Guha's system to monitor the I/O data [Ng, paragraphs 2, 23, 34 and 43].

7. Applicant's arguments with respect to claims 1-15 and 17-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Examiner's Note: Examiner has cited particular paragraphs / columns and line numbers in the reference(s) applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the cited passages as taught by the prior art or relied upon by the examiner.

Should applicant amend the claims of the claimed invention, it is respectfully requested that applicant clearly indicate the portion(s) of applicant's specification that support the amended claim language for ascertaining the metes and bounds of applicant's claimed invention

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM J. GOODCHILD whose telephone number is (571)270-1589. The examiner can normally be reached on Monday - Friday / 8:00 AM - 4:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WJG

/Jason D Cardone/
Supervisory Patent Examiner, Art Unit 2145